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A strategic intelligence unit and a research activities unit were the two main components of a project to undertake inderdisciplinary discussions and studies of problems associated with vocational and technical education in nonmetropolitan areas. Reasons for an interdisciplinary attack were: (1) changes affecting town and rural residents including a multitude of political, social, and economic trends, (2) changes related to job opportunities, school tax burdens, and forced occupational and geographic migration, (3) substitution of capital for labor in farm and industry, drastically decreasing the opportunity for labor utilization in rural areas, (4) reduced farming opportunities, increasing the need for nonagricultural vocational education, (5) small towns and rural areas becoming oversupplied with social institutions designed for less mobile, more agrarian, and more populous areas of a recent past, and (6) questions being raised about the need for consolidation of local governments, businesses, churches, educational structures, and local community services. The appendixes within this report summarize the results of the various activities of the strategic intelligence unit and research activities unit. Additional appendixes to this report are available as VT 007 128-VT 007 131. Earlier investigations are reported in ED 011 068 and ED 011 069. (DM)

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RESEARCH AND DEVELOPMENT IN VOCATIONAL AND TECHNICAL EDUCATION: NON-METROPOLITAN AREAS

June 1968

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RESEARCH AND DEVELOPMENT IN VOCATIONAL AND TECHNICAL EDUCATION: NON-METROPOLITAN AREAS; RESEARCH REPORTS

Robert W. Thomas

Iowa State University of Science and Technology

Ames, Iowa

June 1968

The research reported herein was performed pursuant to a contract with the Office of Education, U.S. Department of Health, Education, and Welfare. Contractors undertaking such projects under Government sponsorship are encouraged to express freely their professional judgment in the conduct of the project. Points of view or opinions stated do not, therefore, necessarily represent official Office of Education position or policy.

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Robert W. Thomas, Associate Professor of Economics, Department of Economics, Iowa State University, Ames, Iowa; and Chairman, Strategic Intelligence Unit of the Project for Research and Development in Vocational and Technical Education: Non-metropolitan Areas.

I. INTRODUCTION

This final report from the project for research and development in vocational and technical education for non-metropolitan areas has been prepared as a synthesis of the total project which had two main components: (1) the Strategic Intelligence Unit, and (2) the Research Activities Unit. The work of these two principal components appear as significant divisions in this report.

A. Problem

A multitude of political, social, and economic changes are affecting the United States population for non-metropolitan areas, problems of vocational and technical education deserve special attention. Certain of these problems are unique. For example, many non-metropolitan areas are poor in productive resources. Financing education becomes a burden difficult to bear. Problems also arise from loss of rural population.

Non-metropolitan area citizens need educational help to interpret changes of which they are a part. Rural residents, capable of profiting from it, need vocational and technical training and retraining to face their changing world of work.

To illustrate how migration has occured, the farm labor force itself has declined by 45 per cent or 4½ million over the past 25 years (13).

Projections indicate only one farm boy out of every 15 can actually be employed in farming during the next 20 years (14). Research suggests that 40 per cent of farm operators must find off-farm employment opportunities over the next 20 years (14). While 40 per cent of the males in agriculture will leave agriculture in the next decade, the rate is projected to be as high as 75 per cent for those in the 15-24 age group and as low as 1 per cent for those in the 45-65 age group (14). Unless important retraining programs can be created for such persons, many will be trapped in farming at low incomes. Under-employment is higher and human productivity much lower in agriculture than in industry.

Further, in towns dependent upon primary agriculture, the major portion of the labor force fares no better than the farm families.

Though the land in farms does not decrease appreciably, the number of farms does. Between 1940 and 1960, the number of farms declined 39 per cent. A further 67 per cent decline is expected by 1980 (14). Moreover, the skills required to operate a farm in the future will differ greatly from those of the past.

Business, services, and social institutions in the rural community are having to make changes as difficult as those taking place in farming. The exodus of the farm population leaves fewer customers to be served by merchants and institutions in the rural town. Consequently, fewer workers are needed in these activities.

Moreover, economic growth and the substitution of capital for labor affect the rural town and rural social institutions, as well as the outlying farms. The forces which have led to larger and fewer farms call for alrger and fewer business establishments to service the farming industry and larger and fewer public institutions for the farming people.

People in the non-metropolitan areas must make great occupational and geographic adjustments to national economic growth and technical change. This forced adjustment can be expected to continue in rural America over future decades. In undergoing these adjustments, rural people have a great present disadvantage in vocational and technical education and frequently in general education as well. The number of high school dropouts from non-metropolitan areas is high (22). Financial support for training may be found to be weak. Local on-the-job training facilities may be scarce. Employment opportunities are often few in number.

Rapid economic growth is making the traditional rural community obsolete. Rural areas are becoming over-equipped with towns, local governmental units, churches, businesses, and laborers. Technological change and economic growth created large scale economic operations. Thus the business, educational, and governmental units must be spread over more space to serve fewer people.

Redirections which are to be demanded of leaders in non-metropolitan areas are urgently demanded. Yet, until recently, this non-metropolitan sector of the United States was almost untouched by national efforts to upgrade its socio-economic opportunities.

B. Purpose

The purpose of this project has been to establish an organization of two principal components to undertake interdisciplinary discussions and studies of problems associated with vocational and technical education in non-metropolitan areas. The two components for these inter-disciplinary studies were: (1) the Strategic Intelligence Unit, and (2) the Research Activities Unit. Through these two structures this project engaged in examination and analysis of problems of vocational and technical education in non-metropolitan areas of the United States.

Working with Dr. Robert W. Thomas as Chairman of the Strategic Intelligence Unit, a group of scholars gathered together to seek to ameliorate educational frustration through inter-disciplinary thinking and discussion. This work and development projects seek to reduce educational problems surrounding vocational and technical education for non-metropolitan areas. This purpose was achieved: (1) by establishing a functioning, workable inter-disciplinary study enviroment, (2) by designing an analytic framework for study of problems of vocational and technical education, (3) by receiving from group members and others, situation reports on present problems associated with vocational and technical education, (4) by proposing new areas for research into vocational and technical education problems, and (5) by sharing the information gathered with those who could be users.

A Standard Metropolitan Statistical Area (SMSA) is defined by the Bureau of the Census as follows: A county or group of contiguous counties (except in New England) which contains at least one central city of 50,000 inhabitants or more or "twin" cities with a combined population of at least 50,000. In addition to the county, or counties, containing such a city or cities, contiguous counties are included in an SMSA if, according to certain criteria, they are essentially metropolitan in central city. In New England, towns and cities are the units used in defining SMSA's (32).

C. Objectives

The objectives of this project were to analyze problems surrounding vocational and technical education in non-metropolitan United States through two related organizational forms: (1) the Strategic Intelligence Unit, and (2) the Research Activities Unit.

II. METHOD

Methods of operation within the project varied between the principal organizational components.

Under the Research Activities Unit inter-disciplinary research in vocational and technical educational problems in non-metropolitan areas was conducted in the customary manner of educational research, each project having one or two principal investigators assisted by local consultants and graduate students.

Under the Strategic Intelligence Unit inter-disciplinary "brain-storming" sessions and special work sessions were used for creative conceptualization of problems associated with vocational and technical education for non-metropolitan area people.

During the contract period (June 1, 1965 through June 30, 1968) this project focused upon priority problems within the setting surrounding vocational and technical education for non-metropolitan areas. The Strategic Intelligence Unit worked on the problem setting. The Research Activities Unit undertook specific research activities.

Problems arising within the non-metropolitan town-rural complex of the United States were the main concern. Because of constraints of time and money, emphasis was placed upon Midwest non-metropolitan areas.

III. RESULTS

A. Strategic Intelligence Unit

1. Inter-disciplinary Interaction. The Strategic Intelligence Unit began inter-disciplinary analysis of vocational and technical education, studying society-wide justifications for training for the world of work. This study was done to establish fundamental concepts useful to discussion and research.

The membership of this Unit, listed in Table 1 interacted with its membership and with invited consultants to gain inter-disciplinary understanding of vocational and technical educational problems.

2. Problem Conceptualization. To aid conceptualization of problems and evaluation of preparation for the world of work, examination of man's realized and unrealized social, economic, legal and educational goals was undertaken. These desires which they have sprung, were considered an important part of the Unit's work. Through this broad approach, new applications of current theory and alternative solutions to present training problems arose.

Generation of a set of concepts and a framework for continuous and long-term study was begun. This work could be used in future analysis of problems of vocational and technical education for non-metropolitan areas

Beginning by taking a necessary broad view of educational problem analysis and condeptualization reminds one that in dealing with the fundamental development of human beings over time, space and socio-economic class, one must recognize existence of numerous complex variables such as: (1) the human population, (2) the existing physical constraints, (3) the existing societal constraints, (4) the interaction of each of these with the other, and (5) the interactions of the first three.

Table 1: STRATEGIC INTELLIGENCE UNIT MEMBERSHIP
Iowa State University, Ames, Iowa

Name	Discipline	Title
Ernest W. Anderson	Aerospace Engineering (Head)	Distinguished Professor of Engineering and Chairman, Education Committee, College of Engineering
George M. Beal	Sociology	Professor
Donald E. Boles	Political Science	Professor
George M. Browning	Agronomy	Professor and Former Associate Director, Agricultural and Home Economics Experiment Station
Ray J. Bryan	Education (Head)	Professor
Clarence E. Bundy	Agricultural Education	Professor
Lowell L. Carver	Vocational Education	Professor
Earl O. Heady	Economics	Distinguished Professor of Agricultural Economics and Director, Center for Agricultural and Economic Development
Alberta D. Hill	Home Economics Education (Head)	Professor
Tevor G. Howe	Education and Educational Research	Associate Professor and Director, Research and Development Project
Virgil Lagomarcino	Education	Professor and Director of Teacher Education
Edwin C. Lewis	Psychology	Professor
John P. Mahlstede	Horticulture (Head)	Professor and Associate Director, Agricultural and Home Economics Experiment Station
Ronald C. Powers	Family Environment (Head)	Professor of Sociology
Marguerite Scruggs	Home Economics Education and Research	Professor and Assistant Dean, College of Home Economics

Table 1 (con't): STRATEGIC INTELLIGENCE UNIT MEMBERSHIP
Iowa State University, Ames, Iowa

Name	Discipline	Title
William G. Stucky (Secretary)	Adult Education	Educational Leader, Center for Agricultural and Economic Development; and Secretary, Strategic Intelligence Unit
Robert W. Thomas (Chairman)	Economics and Adult Education	Associate Professor and Chairman, Strategic Intelligence Unit

To study and discuss ways to handle these variables and their associated problems, the Strategic Intelligence Unit formed committees. A Sub-Committee on Research, with Robert W. Thomas as its chairman, surveyed projects, bibliographies, and research ideas, then made recommendations to the Research Unit. A Conference Sub-Committee was also formed to plan ways to run conferences which the group might hold. Other committees were created as needed. The work of these committees is filed as appendixes to the final report, or in the interim report filed November, 1966 under O. E. 5-85-108.

The Sub-Committee on Research suggested projects examining the three variables: (1) population, (2) physical constraints, (3) societal constraints, and the interaction among these.

The Conference Sub-Committee worked on ways for dissemination of information and for effective group discussion.

At the start, one recognizes: (1) the human variable, (2) the geographic variable, and (3) the cultural and social variable. Each of these complex variables contains within it certain fixed and variable attributes depending upon the time period one allows for analysis. The long-run would see no fixed attributes. For example, an individual has an inherited set of attributes not clearly known and specifically specified at this particular time, but inherited attributes nontheless. Quite possible these are bound to be changeable, with research and development of human beings over time. This is one illustration of the importance of time to this kind of analysis.

In beginning an exploratory model for vocational and technical education problems (problems which are, of course, a part of the total set of social problems), one would consider the human resources with their inherited attributes and their social constraints, the geographic or physical constraints, the cultural and social milieu as constraints, and then time. One could conceive of four general and broad variables in the original conceptual model.

Continuing with this approach one can recognize a "function", and an "organization." Hence, for the concept education, and for vocational and technical education, one can discuss concepts of "functionalism" and of "institutionalism".

Within the functional and institutional concepts, one can characterize education as change in the human being which is brought about by his interaction over time with (1) the structure, (2) other human resources, (3) the social milieu, and (4) the geography of his environment. This change through interaction may be of a formal or of an informal nature. It may be quite direct and obvious or quite subtle and not easily noticed.

The function of education is development of human beings. This function can be formal, informal, insidious, subtle, direct, obvious, "good", or "bad." In a changing society such as ours the ends, goals, and objectives of "functional" education or of "institutional" education may be evaluated as "good" in one period and "bad" in another, depending upon the evaluator, the situation, or the priorities assigned to different attributes of an education.

The ingredients of a conceptual model over time consist, then, of (1) the human resources, (2) the geographic attributes, (3) the social and cultural attributes, (4) the "functioning" educational process for the "civilization" of the human input (a "civilization" defined in terms of dominant societal goals and needs within the existing social and institutional structure).

Take just the first variable, the human resource alone. It has a direct impact upon the social systems, the institutions, the dominant societal goals, and the needs of society. Given the characteristics and socio-economic classes of people, the human resource may act directly or it may act indirectly (through modifying variables) upon these four items. Between human resources, social systems, and social goals exist, with varying significance over class, certain intervening variables which further modify the impact of a given human resource upon a given social system, order, or structure.

Then, in turn, the social systems, orders, structures, and institutions perform certain functions for and against sub-sets of the human resource. Certain indirect and direct modifications arise.

With the permissiveness of modern United States society and the constant change of the 20th century, dominant societal goals and needs are shifting. This needs to be recognized in a dynamic model dealing with the total "functionalism" and "institutionalism" of education of which vocational and technical education is a part.

A model for analysis of vocational and technical educational development may be started in the following manner (based on committee work adopted by the Strategic Intelligence Unit.)

Vocational-technical educational development may be thought of as a dependent variable, "Y". Each of the following may be symbolized, and are variables affecting "Y": human resources (X_1), social systems and institutions (X_2), dominant societal goals and needs (X_3), together with intervening variables, between human resources and social systems (X_4), and between social systems and dominant societal goals (X_5).

Then the following formal statement is conceived:

$$Y=f(X_1, X_2, X_3, X_4, X_5).$$

Many variables modify the characteristics of the human resources (X_1) and the functions of the social systems (X_2). Also the intervening variables between the human resources and the social systems (X_4) create another set of conditions. Between systems and goals (X_5) are yet more modifiers of the training process. Further, these variables possess reciprocal influence on each other. Finally, external "constraints" influence the whole system.

Figure 1 is a concept of relationships affecting today's education. This concept symbolizes today's state of educational arts and sciences. These are taken as the dependent variable, dependent upon the total of all past human events as constrained by factors of nature beyond human control at the time of impact, the second variable which is considered to be the total of all human understanding of these events and constraints, and a third variable which is the total of all of today's human reactions to the past events, to their constraints and to understanding of these constraints.

Figure 1. A Concept of Factors Affecting Today's Education

Today's state of educational arts and sciences

depends upon

The total of all past human events as constrained by factors of nature beyond human control at the time of impact.

and

The total of all human understanding of these events and constraints

and also

The total of all of today's human reaction to the past events and constraints, and the understanding of these

This concept given in Figure 1 emphasizes the total of past events and physical constraints beyond human power, total accumulation of knowledge and understanding about these, and the collective human reaction in the present period to the accumulated knowledge and the events. What this does is emphasize three aspects which are significant in any given time period or any given educational flow or system.

Though problem concepts of factors affecting today's education as discussed above and as shown in Figure 1 may be useful beginnings, these do little to alter immediate educational problems of the present. Hence this level of abstraction needs to be brought closer to present reality.

The process of relation to present reality could follow from the following considerations.

At any given time there exists a set of human resources which display collective and individual human reactions to past events and to present and past constraints. This set of human resources has beliefs and understandings of its collective self and of constraints. These are shown through social systems and institutions established and tolerated. These understandings and beliefs are shown by the kinds of dominant societal goals and needs which this human resource says it should seek.

In a dynamic sense one might say that educational development, including vocational and technical educational development, is a function of the human resources, the social systems and institutions and the dominant societal goals and needs as these are constrained by the external forces of the moment.

Taking this approach causes one to be concerned about past events, understanding of these events, and reaction to these events under three sub-groupings: (1) reaction and interaction with present human resources, (2) reaction and interaction with present social systems and institutions, and (3) reaction and interaction with dominant societal goals and needs of the present period.

Seeking to develop conceptualizations of problem areas surrounding vocational and technical education involves expanding materials discussed in such ways that priority areas of concern to people and leaders can be analyzed.

To lay aside confusion, the first step is to recognize that education has, in its broadest sense, two aspects: (1) a function and (2) an institutional structure. Looking at education in its functional sense, one can say that by defining education as "change with choice" is adequate. That is to say, the dynamic processes of life and matter over which man may exercise no control are beyond the range of this definition of education. However, within the definition are those processes which are at anytime affected by human beings and over which choice may be exercised. This choice may be regarding ones own activity or activities of others. This choice may involve changing the environment, changing an individual, or changing a group of individuals.

The function of education would be bringing about change, at rates and in areas, according to man's choosing. This includes the studying of how these changes occur to develop information which will expand man's range and choice. In other words, man may choose to study, act or do neither. The act of choosing is based upon a state of knowledge. This state of knowledge is a stock on which education draws. The flow, or dynamism, is the functionalism of education and is the process by which change is made by choice.

In dealing with human resources and modifying variables, problems of development of training programs lie in (1) considerations of personal and social significance of work, (2) adult and continuing education, (3) occupational information, (4) career choices, (5) program evaluation, (6) curriculum experimentation, (7) personnel recruitment and development, and (8) program organization and administration.

Success and failure elements of various kinds lie within these priority areas. For example, ways in which human needs for adult and continuing education would be organized by use of curriculum experimentation and program evaluation would contain success or failure elements depending upon goals and objectives of the society or sub-cultural group upon whom the activity is to be performed and for whom the activity is to be done.

Hence, the final need in the conceptual structure is a model for public policy which would permit relating the human resources to publicly acceptable and achieveable goals through media of social organization and informal, ad hoc gatherings. Therefore, each given sub-cultural group which is organized as a part of the total cultural system must have its objectives specified so that they are obtainable by the non-policy workers, or the technicians of the system. Furthermore, since sub-cultural social groups have multiple goals, and each goal has multiple alternatives for achievement, feasible means of achieving alternatives and explicit goals would be part of a model containing public policy objectives.

The preceding discussed generalized conceptual models which can form a background for serious examination of problems of vocational and technical education. Although the background and the variables within the generalized conceptual model are complex and numerous, it is urged that this not detract from an attempt to examine education, its functions, and its institutionalization. It is strongly recommended that the total and broad view be taken at the beginning so that there will be fewer piecemeal and ad hoc attempts to "solve" problems of vocational and technical education. Somehow examiners must come to grips with the total framework surrounding education in such a manner as to grip the functional and structural vocational and technical educational needs of our society.

If one takes a specified category of human resources (with their characteristic interests, attributes and aspirations) which may be oriented towards vocational and technical education (which is presumed here to be a non-baccalaurate goal), one can take this cluster of resources and move it through a vocational and technical educational structure designed to perform certain functions and which is adapted to the achievement of certain ends and objectives. These ends may or may not be specifically aligned with those of the resource input. However, the ends are certainly aligned with those of the decision makers for the structure. One may hope that the decision makers for the structure and the aspirations of the cluster of human inputs into the structure might be similar. If this is the case, and if adequate analysis of a cost-benefit nature can be performed, optimum development of work abilities could be generated.

Though elements of conceptual models may interact and influence other elements, it does not occur all at the same time. The time path of action and reaction presumably could be traced. A dynamic model suggests a means of seeing relationships of vocational and technical education to related components of society.

3. Group Activities. The role of the Strategic Intelligence Unit was creative analytic thinking about the problem setting for vocational and technical education for non-metropolitan areas. To attack these problems, the inter-disciplinary Strategic Intelligence Unit members sought outside assistance and interacted with its own membership to achieve an inter-disciplinary structure under which vocational and technical education could be examined.

This group held frequent seminars and devoted its efforts to defining problem areas, and identifying relevant research activities.

The group noted the problem setting for vocational and technical education as consisting of four principal components: (1) unrealized human, social, and economic goals; (2) existing laws, programs and educational philosophies; (3) past and current theory in research findings; and (4) alternative solutions.

The Unit analyzed in depth problems of vocational and technical education in non-metropolitan areas, thinking creatively in this analysis about the problem framework, the problem context, and the analytic framework.

In performance of its role, the Unit interacted informally to develop a spirit and rapport which would make possible a free flow of inter-disciplinary discussion regarding problems of vocational and technical education. Because of the nature of the training of the membership and the customary orientation toward a discipline approach, an inter-disciplinary approach was achieved, but not readily achieved. Considerable effort on the part of the group was necessary in order to achieve an effective inter-disciplinary consideration of problems surrounding vocational-technical education and problems of specific vocation and technical educational needs.

Work of the members during and between meetings brought the following results. The Strategic Intelligence Unit, received, reviewed and discussed: (1) materials from the United States Office of Education, (2) materials relating to priority needs for research and exploration, (3) materials related to definitions of terms and work areas under the Vocational and Technical Education Act of 1963, (4) reports on definitions of terms, (5) reports dealing with priority areas for research and development, (6) items on research and development activities, (7) analyses of the total problem context for vocational and technical education, and (8) statements of purposes of adult and vocational educational training.

Definitions of parameters of the Unit work under the vocational and technical educational problem were discussed. The Unit's problem was defined as two-fold: (1) to suggest kinds of training opportunities now needed and not available, and (2) to seek to arrange in priority fashion the kinds of trainings which would have the highest payoffs to society. To assist in understanding these two tasks, speakers were arranged.

Dr. Selz Mayo, North Carolina State University, Raleigh, North Carolina discussed problems of occupational training and organizing centers of study. Ways in which regional and national work could be developed were discussed.

A discussion of vocational educational needs in agriculture, needs in agricultural education,was led by Mr. Clarence Bundy. Mr. Bundy discussed (1) Iowa's survey of farmer replacement needs for Iowa, (2) factors related to the occupations of Iowa farm male high school graduates, and (3) competencies in agriculture needed by males employed in retail farm machinery distribution. Qustions regarding the rigidity of training within vocational education arose. A further problem included relationships of colleges to junior colleges and to vocational school programs to be developed in area vocational schools. Questions were raised on who is going to provide adult educational training and informal educational assistance needed by the farmer of tomorrow.

Dr. Trevor Howe and Dr. Robert Thomas attended meetings in Minneapolis, Minnesota to discuss occupational education problems, to review research and development resources available, to consider how a regional educational laboratory can contribute to research and development activities, and to make recommendations on programs and functions.

Dr. Donald Boles reported on governmental implications of area vocational-technical schools in the state of Iowa. The crucial variable identified in the governmental framework was the implementing strategy. Questions of who made decisions for vocational and technical schools on their programs were discussed.

Mr. Waldo Wegner, director of the Center for Industrial Research and Service, Iowa State University, Ames, Iowa, discussed demands for vocational and technical education skills within the state of Iowa, particularly those demands of smaller companies for workers in categories such as machinists, draftsmen, welders, and supervisory personnel. Smaller companies are unable to embark on their own training programs. These firms would like to be able to cooperate with schools on training programs. Union rules of apprenticeship create certain conditions regarding free entry and easy access to certain technical activities. Five areas of training were discussed: (1) training to achieve individual and initial productivity, (2) training for renewal, (3) training for professional improvement and for promotion in professional activities, (4) adult education which enables institutional reform to develop, and (5) training of the retarded.

Dr. Neal Gross discussed problems involving developing policies relevant to vocational and technical training. Focusing on the non-metropolitan areas he believed to be important. Hopefully, the vocational and technical educational research will provide meaningful education for the disadvantaged of the population. Questions of job realism of intensity of study and of interest were raised. Urban youth frequently have very low occupational realism. This may be true of rural youth. Though young people are eventually going to migrate from agriculture, little knowledge is held of what the jobs will be like or of where the jobs are.

Dr. Harold Ellis, Director of the Technical Institute, Iowa State University, Ames, Iowa, discussed vocational-technical needs from the standpoint of the institute. Problems discussed included: (1) programs of study, (2) automation, (3) intermediate and long run values of programs, (4) the individual's ability and achievement, (5) the questions of family background, and (6) the impact this has on individual motivation.

Dr. Murphy, discussed problems associated with vocational and technical education and the measurement of educational programs. Dr. Murphy, who is operations research analyst, National Bureau of Standards, Washington, D.C. discussed her work dealing with the effect of technology on manpower development and utilization.

Dr. Murphy, in her particular work, surveyed counsellors in six cities to see what they considered to be the needs of forecasting and the uses of technological information forecasting. Counsellors were eager to receive the information, but not certain how it might be applied or used by students. Differences among students and their need for different time perspectives became part of the discussion.

Dean Helen LeBaron discussed problems of vocational and technical education based on her experience. Discussion included: (1) continuation school for young people who ordinarily do not go to school or would go only part of a day and work the balance of the day, (2) upgrading vocational and technical education, and (3) technical institutes developing around the country.

Problems of gaining concensus were discussed. Where schools for vocational and technical education should be located, and how they should be administered were discussed.

The United States has had problems in being successful with vocational programs. In general, students who are attracted to vocational and technical educational programs have not had a great deal of success in typical tradition academic programs. Some changes have occurred which partly arise from the change in philosophy regarding vocational and technical education. The Job Corps has been developed. Programs for people who do not go to college have been developed. However, prestige of the training is a problem factor in these. Problems of women (who seem to be the forgotten group) in vocational and technical education were discussed.

Mrs. Barbara Rougvie and Dr. Alberta Hill, acting for Dr. Scruggs, reported on their study of vocational and technical education. Discussed were differences of opinion on meanings of vocational and technical education, and how different pieces of federal legislation affected vocational and technical training.

B. Research Activities Unit: Appendix Two

The Research Activities Unit carried out research on problems related to vocational and technical education for non-metropolitan areas in the following categories: (1) human resources development, (2) occupationl opportunities assessment, and (3) educational resources development and training.

The Research Activities Unit was under the direction of Professor John P. Mahlstede. Results of earlier research activities funded under this project are reported in the appendix to the interim report of November 1966. Recent research activities appear in appendixes one and two to this report.

Each research activity has a detailed and separate report. From appendix one of this final report, a brief review of significant results has been made and is reported below.

1. Activity 1. This activity dealt with the decision-making process of school districts regarding vocational education

and training programs. It examined the nature and scope of school bond elections requesting funds for vocational and technical educational purposes.

Results of this research showed a complex process to exist for proposing and implimenting school bond issues. The process involved many different actions and consultations with many different groups. Techniques and strategies varied widely and apparently depended upon the differences in specific target audiences.

Results of the analysis were based on percentage figures with percent of affirmative vote chosen as the dependent variable. Results were obtained by analysis of voter turn-out and of interviews. Relationships were obtained through multiple regression analysis.

Among variables found significantly related to per cent of affirmative votes were: (1) the perceived importance of the citizen's advisory committees in planning and publicizing the bond issue campaign, (2) the perceived value of the parent-teacher association in the bond issue campaign, and the responsibility assumed by the superintendent and the Board of Education.

2. Acitivity 2. This activity dealt with occupational problems and vocational training needs of high school dropouts in rural Iowa.

Results indicated that only in a few cases was the decision to leave school a spontaneous one for the dropout. For this reason dropping out has been sometimes referred to as the "dropping out process." Because of the necessity to identify the potential dropout before withdrawal, increasing attention has been placed upon identifying characteristics common to most dropouts. Most dropouts came from families of a low socio-economic class.

3. Activity 3. This research activity dealt with the interrelationship of home enviroment and employment for 40 workers within an Iowa community.

Results indicated such employment characteristics as seniority on the job, moving about or job mobility, and absenteeism all were related to home environment.

Within the home environment, the characteristics of the spouse, the nutritional level, the social patterns, the authority patterns, and the household management abilities displayed were also found to be related to employment patterns of the workers.

4. Activity 4. This research activity dealt with manpower requirements and demand in agriculture by regions and nationally, with estimation of vocational training and educational needs and productivity.

This continuing activity deals with estimation of labor and manpower developments in agriculture and the related agri-business sector of the nation for as many as 144 regions of the country. The activity points toward changes in agriculture and vocational and technical requirements for this activity and for farm people over the next 15 years. Much of the analysis relates to estimation of the structure of the agricultural work force and its skill requirements at future points in time.

Results indicated that inter-sector economic and labor flows, and the dependencies of these sectors upon agriculture and labor could be, analyzed through an input-output model. Within this model agriculture was divided into regions and commodities to determine flows and inter-dependencies.

Results from this model showed major regional changes to be in store for agriculture and its manpower requirements over the next 10-15 years. While the greatest number of the 144 regions were shown to be intensifying their production, they were also shown to be specializing by putting more emphasis on technology.

5. Activity 5. This research activity examined problems of predicting change in technology, jobs, and vocational training needs in rural (non-metropolitan) labor markets.

Results of aspects of this study for two functional economic areas are summarized here.

Results of statistical analyses led to the following hypotheses being accepted: (1) there was no difference in dollar sales between or among location centers within two functional economic areas examined, (2) there was no difference in per cent of total business between the two areas or among the location centers within these areas, (3) there was no difference in per cent sold within 10 miles driving distance between the two areas or among the location centers within these areas, (4) there was no difference in miles to the most distant customer between the two areas or among the location centers within these areas, and (5) there was no difference in prices between the two areas or among the location centers within these areas.

6. Activity 6. This research dealt with the potential contribution of psychology to inter-disciplinary research in vocational-technical education.

Results from this work have shown that psychological research dealing with the aspiration level of high school students is fairly extensive. This work indicates that aspiration levels may be considered as important to success in vocational and technical education.

Studies dealing with the influence of the high school teacher upon student aspiration stress that the educator, as a model for student performance, has significance for appropriate goal settings. Psychology research also indicates that areas of student interest have implications for success in vocational and technical education.

7. Activity 7. This research activity dealt with determinants of the post-high school educational and occupational choices of Iowa farm boys.

Results to date include data collection and some analysis.

Data were collected in a series of state wide surveys covering a sample of 790 farm boys who graduated from Iowa nonmetropolitan high schools. These data have been coded and put on IBM cards for analysis.

This activity is aimed at increasing the stock of knowledge of (1) the determinants of educational and occupational choices of farm boys, (2) factors that restrain post-high school investment in education, and (3) amounts of under-investment or overinvest in training for farm boys.

8. Activity 8. An analysis of legal and political problems and the strategy necessary for implimenting programs under the Vocational Education Act of 1963 was the subject matter of this research activity.

Research results include: (1) a study of the process of program evolution for area vocational schools in Iowa, (2) a bibliography of studies dealing with vocational and technical education by state and federal agencies, and (3) a study of congressional hearings held regarding the Vocational Education Act of 1963 and related measures. Summaries of recent projects reported in appendices to this final report are given next.

C. Research Activities Unit: Appendix Two

1. Activity one deals with career decision-making processes of Iowa young adults. This project was undertaken in order to obtain a better understanding of the influence that high school aspiration of youth have on their attainments in adult life. The research focused on three major aspects of the career decision-making process: 1) migrating from the home community, 2) obtaining additional education beyond high school, and 3) choosing an occupation.

In 1948, 157 graduating high school seniors from nine rural high schools in the north central grain region of Iowa were personally interviewed concerning their background characteristics, migration expectations from their home communities, and their occupational and educational aspirations. In 1956, 152 of the initial respondents were again personally interviewed to determine personal caracteristics, migration performance, the occupations attained and the amount of education achieved to that time. Again in 1967, 143 of the original sample were interviewed by mailed questionnaire concerning personal characteristics, migration performance, educational and occupational attainments and perceptions of the new Iowa Area Vocational-Technical School program.

The major objectives of the study were to determine the relationships between migration, occupational and educational aspirations of high school seniors and their attainments in adult life; to determine the differences in career patterns between males and females, farm and nonfarm residential backgrounds; and to determine the relationships between the social and personal characteristics of young adults and their migration performance, occupational attainments and educational achievements.

The data were used to compute chi-square and correlations tests. A number of significant differences were found in the data collected from 1) those who migrated from their home communities and those who did not leave their home communities, 2) those who aspired to continue their education and those with no educational aspirations, 3) those who attained additional education after high school and those who did not attain any additional education, and 4) those who attained high status occupations and those who attained lower status occupations.

The findings substantiate the following generaizations grouped according to that aspect of the career decision-making process which they help explain. The aspirations data was expressed in 1948 by the respondents, and the attainments data were gathered in 1967.

A. Migration-leaving the home communities:

1. Compared with males, greater proportions of females expected to migrate from their home communities.

2. Greater proportions of males than females were undecided concerning their migration expectaions.

3. A greater proportion of females than males had migrated from their home communities 19 years after graduation.

4. Propensity to migrate was essentially the same for farm and nonfarm females.

5. Propensity to migrate was greater for nonfarm males than for farm males.

6. Propensity to migrate was not related to socio-economic background of the youth.

7. A greater proportion of the youth who discussed their future plans with their parents left their home communities than those who infrequently discussed their future plans.

8. Those who aspired to continue their education beyond high school were more likely to migrate than those with no intentions to continue their education.

9. Males who migrated from their home communities were more likely to be employed in white-collar occupations that in farming or other blue-collar occupations.

10. Compared with males, females migrated at a faster rate after graduation.

11. Compared with females, greater proportions of males resided on farms 19 years after high school graduation.

B. Occupational aspirations and attainments :

1. Significan relationships were found between occupational aspirations of the youth and mothers' educational background, educational aspirations and educational attainments.

2. No significant relationships were found between occupational aspirations of the youth and residential background, socio-economic background, fathers' educational background, fathers' 1948 occupation and the frequency of discussion of future plans with parents.

3. Significant relationships were found between the occupations attained by the young adults and their socio-economic background, fathers' education, mothers' education, migration performance, occupational aspirations, educational aspirations and educational attainments.

4. No significant relationships were found between occupational attainments and residential background, fathers' 1948 occupations, and frequency of discussion of future plans with parents.

5. Single variable relationships (r) provided relatively small amounts of the explained variance (r^2).

6. Compared with females, greater proportions of males attained the occupations they had aspired to at the time they were seniors in high school.

7. Parents' occupational asirations for their children were related to the parents educational background and the migrations performance of the parents.

8. Parents' occupational aspirations for their children were not related to the sex of the respondent, residential background of the parents and occupational attainments of the parents.

C. Post high school education:

1. Propensity to obtain additional education beyond high school was essentially the same for males and females.

2. Propensity to obtain additional education beyond high school was essentially the same for farm and nonfarm youth.

3. Youth with higher socio-economic backgrounds were more likely to aspire to and attain additional education beyond high school than those with lower socio-economic backgrounds.

4. Youth whose parents had higher educational attainments were more likely to aspire to and attain additional education beyond high school than those whose parents had lower educational attainments.

5. Youth who frequently discussed their future plans with parents were more likely to aspire to additional education beyond high school than those who infrequently discussed their future plans, but no relationship was found between educational attainment and frequency of discussion with parents.

6. As compared to males, greater proportions of females attained additional education beyond high school.

7. Of those who received college degrees, greater proportions of the youth aspired to continue their educations than had no intentions or were undecided concerning additional education.

8. Greater proportions of those who had additional education beyond high school resided outside their home communities than resided within their home communities.

D. Iowa Area Vocational Schools:

1. Most Iowa respondents were aware of the Iowa Area Vocational Program.

2. Iowa respondents became aware of the Iowa Area Vocational Program through mass media.

3. The majority of the Iowa respondents were favorable toward the Vocational Programs.

4. The majority of the Iowa respondents were not familiar with the specific courses available to adults.

2. Activity two discusses vocational education and occupational aspirations of high school students with no college plans.

A number of studies have been completed concerning the occupational and educational aspirations and plans or rural youth. The great majority of these studies have concentrated on decision making regarding those youth planning to attend college. The present study focuses on those students who for one reason or another have no plans to attend college. They may not have the motivation or capacity to attend college, or they may lack the necessary financial support or resources to obtain a college education. In their decision making process these students have alternatives available such as serving their military obligation, going immediately to work or obtaining some kind of vocational technical education or training. The general consensus is that most of those who do not attend college go to work. Also, it is believed that some students who choose to go to college more realistically shoud go into vocational education and training.

This study explores the occupational and educational decision making process of 835 male high school seniors with particular emphasis on those who do not plan to attend college. It attempts to answer a number of questions. What is the nature of the high school counseling process? What is the range of educational and occupational alternatives perceived by graduating seniors? What image do they have of various occupations? What are the sources of information concerning occupations available and utilized by high school students?

What do they know about necessary training for specific occupational careers? What do they know about the work world of vocational occupations? What are their perceptions of the rewards and advancements in alternative occupations? What do they perceive the occupational structure to be in 1970-1975? Data also will be obtained regarding the knowledge of vocational educational opportunities provided by the new vocational area schools in Iowa.

The new Area Vocational School district arrangement in Iowa made it possible to examine many of the above questions in a comparative framework. That is, the study will focus on differences, if any, between male senior youth who plan one of the following alternatives after graduation from high school:

1. to seek immediate employment
2. to attend a trade or Area Vocational School
3. to attend a four-year college in a degree program
4. to go into the military service.

The objectives of this study were to examine youth soon to graduate from high school to see if there were differences between those planning to attend college and those who do not. More specifically the following are the objectives of this study:

1. To dtermine the educational and occupational decisions and the decision making process of high school students, with emphasis on those without college plans.
2. To determine the range of occupational alternatives perceived to be available by high school students.
3. To determine the awareness and knowledge of high school seniors regarding vocational education and training available and the sources of information used in obtaining this information.

A sample of Iowa high school senior males was drawn from four selected Area Vocational School Districts. These four districts were selected due to the fact that each has a vocational technical school. Almost all other Area Vocational Districts and vocational technical training schools are organized in conjuction with a community or junior college. These four districts were selected because of the interest in measuring knowledge and plans in relation to vocational technical schools. Another limitation was placed on the size of community from which the sample was drawn within the individual Area Vocational District boundary. All centers of over 10,000 population were excluded from the sample since information was sought for a nonmetropolitan sample.

All local school districts within each of the four Area Vocational School Districts were rank-ordered by size of the senior high school enrollment. All schools in each Area Vocational District were rank ordered into groups of three starting with the three largest schools in each district. This procedure was continued until all local school districts in all four Area Vocational School Districts had been rank ordered. By random procedure one district was selected from each cluster of three districts for each Area Vocational District. This procedure produced seven local school districts for each Area Vocation District or a total of 28 possible local school districts. No provision was made for replacement districts, and ultimately responses were obtained from all 28 districts.

Although school districts were selected in the sampling technique, students are the major unit of analysis and statistical tests will be computed using the total sample of students from the 28 locat districts. Selected comparisons will also be made among the four Area Vocational Districts. No identification or examination will be made of the 28 individual local districts. All senior males present on the day of interview were interviewed in a group interview setting. No provision was made for interviewing those not present or available on the day interviewing was scheduled for an individual school. All selected districts participated in the survey and a total of 835 individual student questionnaires were obtained.

A questionnaire was constructed and pretested before administration to the sample. Although the youth responded to the questionnaire in a group setting (senior males were usually assembled in a large room), each individual filled in a separate questionnaire.

The instrument consists of 49 questions aimed at providing information about; knowledge of area vocational schools; plans for immedicate and long-range educational and occupational plans; real versus desired choice of occupation if money, ability and time were not limiting factors; information on training requirements and starting salary for selected occupation; and attitudes and orientations toward work, time, change, physical labor, geographical mobility and education.

The questionnaire was designed and the pretest indicated that the information could be collected within the one perios variance of school period limits (50-60 minutes).

Since analysis has not been completed, selected items (questions) from an approximately one-eighth sample (100) of the 835 interviews were examined. Hence, these results are considered tentative, but somewhat indicative of the range for the variables examined. A random number was selected and each eighth schedule was drawn until a sample of 100 had been obtained.

Slightly more than two-thirds (68%) planned to obtain formal education. Relatively few planned to go to work immediately (15%) and 5 per cent stated they were undecided in their plans for next year. Almost the same percentage (65%) said that additional education was necessary for the work they planned to enter. Only 10 per cent said further education was unnecessary, and the remaining 25 per cent said additional education was desirable.

When asked what kind of school they planned to attend, the greatest per cent, 32 per cent, responded that they would attend a four-year college or university. Thirty-one per cent indicated they planned to attend vocational schools, both public and private. Many more you had considered attending vocationa school (67%) than actually planned to attend (31%). Many of those who responded that they had not considered attending vocational schools had heard of the area vocational schools in Iowa. Eighty-seven percent said they had heard of these schools and the community college programs. Not all who had heard of the programs felt they had sufficient knowledge to decide whether to attend the area vocational schools. However, about two-thirds felt they had sufficient knowledge to help make the dicision.

Information was sought on the social status ranking of the occupation the students would like to enter if ability, cost, and amount of training were of no concern. These occupations were then ranked on a modified North-Hatt occupational scale. The original North-Hatt scale ranks occupations from a low of 33 (bootblack) to a high of 96 (supreme court justice). The respondents' specified desired occupations ranging from 47 (factory laborer) to 93 (physician). The median occupation desired fell in the 76 status score ranking (represented by occupations such as farmer, high level management positions, and higher ownership positions in small businesses). The students were then asked to give the occupation they thought they would probably enter. These responses also were scored on the modified North-Hatt scale. Some decrease in the scale scores was noted in this more realistic expression of probably occupation of entry. However, it should be noted that some occupations require time to attained. Hence lesser scale scores of entrance should be expected even if many youth mention higher status occupations they would like to hold if there were no restriction. The range of probable occupational entrance was from 47 (factory laborer) to high of 86 (various scientific and professional positions). The median entrance score was in the 73 (represented by occupations such as higher skilled trades and various technical positions) status prestige score. Since no statistical tests were computed no statement of significance can be made, but there was a reduction in the occupations they thought they would enter from some of the more prestigious occupations given when encumbrances were not considered.

Respondents were asked if they planned to enter the same occupation as their father. Only 8 per cent said that they did, 72 per cent would not and 20 per cent were undecided. In addition, all respondents wanted to be at least as successful as their fathers-- two-thirds wanted to be more successful. Further, the students were asked which of the factors were most important in comparing their success with that of their father. Income was most important for 45 per cent of the respondents, 38 per cent stated work satisfaction and 14 per cent, community standing.

These tentative and preliminary results give some indication of some of the kinds of data available and some indication of the trends for the total sample of 835.

Data for this project have been collected from senior high school males in 28 school districts. The data represent a stratified random smple of high school senior males from the four Area Vocational School Districts that are autonomous vocational technical schools. All other Iowa Area Vocational Districts are combined with community or junior college districts. Hence, the influence of and knowledge about the area vocational school would have been somewhat more difficult to measure under these conditions.

Preliminary results indicate that most youth have given some thought to their educational and occupational plans beyond high school. There was some tendency to engage in fantasy choices when asked which occupation they would enter if time and money, were not considered. This discrepancy was relatively minor in the subsample examined in the tentative results section. Students want to be as successful as their father and two-thirds of them want to be more successful.

Further, most of the students were aware of the area vocational schools. About two-thirds of them felt they had sufficient information about these schools to decide whether they wanted to attend or not. About 31 per cent stated they planned to attend an area vocational school.

The present state of analysis prevents a summary of results of this study. The data are undergoing tabulation and statistical analysis for tests of significance between those going on to college and those attending Area Vocational schools or who plan no further education beyond high school. This analysis and publication of findings will be carried out by Iowa State University after the termination of this contract.

3. Activity three dealt with differential non-income occupational vocations for Iowa farm boys.

In an effort to indentify factors associated with variability in non-income occupational values, a number of characteristics of three groups of youth were compared. The following results arose:

1. Variation in preferences for the non-income attributes of farming appeared to be independent of the level of education of both fathers and mothers.

2. Boys who placed a relatively high value on the non-income attributes of farming were more likely to be planning to go to work upon high school graduation than to get additional education. Boys who placed a relatively high value on the non-income attributes of nonfarm occupations were more likely to be planning additional education.

3. Boys who placed a relatively high value on the non-income attributes of farming had fathers and mothers who were more likely to want their son to go to work than to take additional training after high school graduation.

4. Variation in the boys' preferences for the non-income attributes of farming appeared to be related to 4-H and FFA experiences.

5. Over three-fourths of the fathers of boys who were willing to sacrifice $2,500 or more to enjoy the non-income attributes of farming wanted their son to be a farmer, whereas only 12 per cent of the fathers of boys who were willing to sacrifice $2,500 or more to enjoy the non-income attributes of nonfarm occupations wanted their son to be a farmer. Similar differences were found among mothers.

6. The farm-nonfarm non-income valuations of the boys seemed to be related to high school academic achievement and to I.Q. Boys who were willing to sacrifice $2,500 or more to farm had a mean grade point of 1.8 and a mean I.Q. of 100.8. Boys who were indifferent between the non-income attributes of farming and nonfarm occupations had a mean grade point of 1.9 and a mean I.Q. of 103.3. Boys who were willing to sacrifice $2,500 or more to have a nonfarm job had a mean grade point of 2.4 and a mean I.Q. of 106.9.

7. The boys' valuations seemed to be independent of size of school attended as well as the farm-nonfarm composition of the senior class.

8. Boys who placed a relatively high value on the income attrubutes of farming had spent more time at farm work during the school year and summer than boys who placed a relatively high value on the non-income attributes of nonfarm occupations.

9. Boys who were willing to sacrifice substantial income ($2,500 or more per year) to farm were more likely to have formulated their occupational plans before the 10th grade than those who were willing to sacrifice substantial income to have a nonfarm job.

10. Occupational plans of boys who placed a relatively high value on the non-income attributes of farming were more likely to be influenced by work at school and parents than the occupational plans of boys who placed a relatively high value on the non-income attributes of nonfarm occupations. The occupational plans of the latter group were more likely to be influenced by study at school, reading in books and magazines and vocational guidance counselors than those of the farmer group.

11. Boys who had strong preferences for the non-income attributes of farming also tended to prefer more frequently work out-of-doors, work in or near present location, country living, less contact with people, work in small organizations, physical work and work with machines than boys who had strong preferences for the non-income attributes of nonfarm occupations.

4. Activity four deals with the interrelationship of home environment and employment.

Increased knowledge of relationships between characteristics of the home and family of the working man and his performance in employment is needed by vocational education as well as by employers. Few studies have explored this concept to date. Such information could be used in providing for more effective development and utilization of human resources at various stages of education and employment.

Based on the results of a pilot study, phase I, the objectives of the survey, phase II, were:

1. To determine interrelationships among selected characteristics of home environment and performance of employees in skilled, semi-skilled, or unskilled jobs.

2. To make recommendations regarding programs in vocational and technical education designed to serve such workers, their families, and business and industry in nonmetropolitan areas.

The sample was selected from Iowa companies manufacturing fabricated metal products, machinery and equipment. Criteria for selecting employees to be included in the study for both phases of the research were: (a) each man was married with his wife living at home and employed outside the home no more than 20 hours per week; (b) each family included one or more children under the age of 18 living at home; (c) each man had completed at least an eighth grade education according to company records; (d) each was first employed by the company at an entry level "blue-collar" job.

The sample of 40 families in the pilot study included two criterion groups of 20 each with one group consisting of men in the lower wage groups and the other group in the upper wage groups in one company at the time of the study.

Approximately 15 companies participated in phase II. Each man was initially employed by the company during 1955 through 1959 and was born no earlier than 1925. In most companies a census of eligible families was used.

Employment variables included such characteristics as advancement in terms of job levels, gain in wage rate, wage rate and job level at time of study, and 1967 gross income from wages. Other employment variables included behavior of the employee on the job.

Variables related to the home included such charateristics as educational history of the husband and of the wife; beliefs of the husbands and of the wives regarding decision making in the family, the family and its members and development of children; attitude of the wife toward food preparation; wife's knowledge of food fallacies; food and clothing practices; social participation; roles of husband and wife in money management; and health of husband and wife.

The two interviewers in the pilot study were professional home economists. In phase II representatives of the Iowa State University Statistical Laboratory selected interviewers in each of the geographical areas. These interviewers were trained in a one-day training session at Ames.

Data in the pilot study were obtained from the cooperating company, the employee by means of questionnaire left at the home, and the wife of the employee by means of an interview. Data for phase II were collected from the cooperating companies, the employee and his wife by means of interviews, and observations of housing by the interviewers. Items included in the interview schedules were based upon results of the pilot study and consultation with experts in relevant diciplines.

Methods of analysis used in phase I were development and analysis of case studies, comparison of means of the groups, and examination of intercorrelations among variables. Methods of analysis in phase II are reported in two theses in progress, and this report includes methods used in analyzing data from 37 families employed by five companies in three of the geographical areas included in the study. Cross runs were made and data were inspected.

In both phases of the study there was wide variation among families in regard to many of the characteristics studied including income from wages, absence from work, housing status, and educational level. No single statement could accurately describe these workers and their families.

There was evidence of interrelationships of some characteristics of the home environment and the employment record of the husband although results to be reported in two theses in progress will help determine the extent to which such conclusions need to be tentive. In the pilot study wives whose husbands were in the lower wage groups had less favorable attitudes, in general, toward their son's having the same job as their husband than wives of employees in upper wage groups.

There was a slight tendency for husbands in the lower wage groups to assume a more authoritarian role in decision making in the family and for wives with slightly higher levels of education and with husbands in upper wage groups to share in the decision making responsibility.

Dietary intakes of 87.5 per cent of the women and 27.5 per cent of the men in the pilot study were fair or poor.

Any relationship between educational levels of the husband and wife and the husband's advancement in job levels was obscured by the probable ceiling effect for those entering jobs at a higher level. Analysis of data within companies to be reported later should clarify the picture by eliminating the confounding of company with other variables under consideration.

For the small sample for which data have been analyzed more of the wives than husbands in the group who had advanced most in job levels stated that the goal of providing a good education for the children was very important. Husbands who had not advanced tended to place more importance upon the goal of having the husband advance in position or rank on his job with the company than did their wives.

Because a large proportion of the families were in homes of good structural condition, there was no relationship between this characteristic of the house and advancement on the job.

Knowledge of child development on the part of the wives and husbands appeared to be related to advancement of the husband in job levels. Results were inconclusive on this small sample in regard to relationships between beliefs about other areas of home economics and advancement in job levels. There appears to be no relationship between scores of the wives and the advancement in job levels of the husbands, but there did appear to be a slight positive relationship between the scores of the husbands and their advancement in job level. There appeared to be no relationship between attitude toward decision making about money and advancement in job level by the husband.

The group of workers included in the phases of this study were stable employees of manufacturing industries. The wide variations among the couple indicate that any attempt to describe all such workers and their families as one group having common characteristics would be inadequate if no inaccurate. It is recommended that vocational-technical education aimed at serving present and potential industrial workers take into account the many individual differences among the student.

Analysis of the findings to date indicates that there are relationships between selected characteristics of the home environment and employment records of industrial workers; however, additional analyses are needed before definite conclusions can be reached. Hopefully two theses in progress will lead to improved ability to differentiate between home environment variables in terms of their relationship to specified employment variable as well as to differentiate among individuals and conditions for which such relationships would be crucial.

5. Activity five dealt with manpower requirements and demand in agriculture by regions and nationally, with estimates of vocational training, educational needs, and productivity.

The movement of people from rural to non-farm areas raises a very definite question about the funding of rural schools regarding the payoff to increased education. These people incur the expenses of education in rural areas and "payoff" in non-farm locations. This transfer from farm to non-farm locations is something for which most rural areas receive no compensation. This matter could rightly be the subject of further attention.

The results of this study appear as follows:

1. U.S. agriculture will undergo considerable changes in the period 1965-1980. These changes involve the relocation of production with differential effects occuring between crops

and between different geographical regions of the U.S. These shifts in production can be expected to bring about changes in resource use which both directly and indirectly involve labor.

2. Farm labor use will decline substantially through 1980. Both hired and family labor will be affected. Each is expected to decline nationally about 36 per cent from 1965.

3. There will be regional differences in the decline of farm labor utilization. The largest declines are projected for the Delta States region and the least decline will occur in the Pacific region. There will be an absolute decline in the number of people required in agriculture in all regions through 1980.

4. Agribusiness employment represents only one alternative in many facing migrants from agriculture. It would thus appear that it would be better to offer a broadbased education to all rural people rather than to consider education of this group of people to be primarily of an agricultural orientation.

5. Agricultural education must increasingly become a training ground in management science. Management and organization is clearly the need of the future in agriculture.

6. Hired farm workers will increasingly require strong background and training in the technical issues of farming. These will include the chemistry of fertilizers and herbicides, and the operation and maintenance of all types of machinery. Education must emphasize the fundamental issues involved in these and other technologies.

7. Planning of agricultural vocational education programs should be oriented to a continuous decline in the number of participants in these programs. Consolidation of facilities will also be persistent need of this type of educational program in spite of the need to train some people for agribusiness employment in these programs.

8. Continuation of programs in vocational agricultural education would appear to be justified (at least in very broad terms) by considerations of their profitability. Such a conclusion is however tenuous. Decreasing numbers of people in these programs can quickly raise costs particularly if consolidation of facilities do occur at commensurate speed.

Six quantitative research methods have been used to evaluate the amounts and types of farm labor needed in the United States in the future. The year 1980 was arbitrarily chosen as a focal point for these investigations. The analyses have been conducted at various levels of aggregation, nationally and regionally. The various methodologies used include input output models, linear programming, time series analysis, production function analysis and other methods of general quantitative research.

Results of these analyses suggest considerable change in the structure of agriculture through 1980. This in turn has implications for agricultural education programs and suggests areas for change and additional attention.

Changing production and movement of production between locations within the U.S. forms the basis for the changes noted. Wheat and soybean production is expected to increase while feed grain and cotton production will decrease somewhat. Individual regional effects are significant. Accompanying these changes there will be an increase in capital use in all regions, and an absolute decrease in all types of farm labor used. Regional effects are important. An analysis of the patterns of demand for farm labor within different regions has shown that the biggest changes will occur in the Delta States region.

An analysis of trade and employment in the agribusiness sector at the national has been made. Results reflect a trend towards automation in the industry. Demand for services from this sector is increasing but total employment is not growing at a similar rate. Employment is growing at a slower rate than production. Further this rate is lower than that currently being experienced in other sectors of the economy.

Various aspects of past and present educational programs for rural people have been examined. Conclusions have been drawn from regarding these programs in the light of the information available about the future structure of agriculture. The most striking conclusion relates to the much higher ratios of land-to-labor and capital-to-labor anticipated in agriculture through 1980. These indicate that all classes of farm labor will have to be more technically skilled in order to be able to handle the types of management and operational problems associated with this more technical type of production in the future.

The relative profitability of rural education has been examined. While the analysis suggests that this area is still a profitable avenue for investment, increasing costs per student may endanger this as the number of people involved in agriculture decreases. Consolication of facilities for rural education would appear to be unavoidable under these circumstances.

6. Activity six dealt with the potential contribution of psychology to research in vocational-technical education.

This project, which was funded through the USOE grant for research in vocational and technical education, was begun in April, 1966, and completed in August, 1967. This project employed a half-time graduate assistant, and the project director was supported for two weeks during July, 1967.

The project had two major aspects: the collection and organization of previous psychological research which had a bearing on vocational and technical education, and an experimental study of the influence of suggestion on vocational aspiration.

The collection and organization of psychological research relevant to vocational education was begun in April, 1966, and completed in June 1967. The initial phase consisted of a thorough survey of the Psychological Abstracts for the past thirty years to locate research studies of relevance. Other sources, such as relevant textbooks and ERIC summaries, were also included in the survey. The research studies thus collected were organized by areas, and summaries of each area were complied. Finally, gaps within each area were identified and research designs were developed to provide information to fill these gaps, with emphasis on research which might be of special interest to the staff of the Iowa State University Department of Psychology.

The specific research study itself was begun in January, 1967, and concluded in July, 1967. It was conducted by the graduate assistant, under the supervision of the project director, and was entitled, "The Relationship between Teacher Expectations and Pupil Occupational Aspirations," with emphasis on students in rural areas. Data were collected in February, 1967, and in May, 1967, and were then analyzed and interpreted. The results were submitted as an M.S. thesis to the ISU Graduate College during the summer, 1967.

This research dealt with the potential contribution of psychology to inter-disciplinary research in vocational-technical education. A thorough survey was made of the psychological literature to determine knowledge already gained through research which might be applicable to vocational-technical education as well as gaps in the knowledge which psychological research could fill. Discussions with staff members of the Iowa State University Department of Psychology located specific areas of relevant research interest which they prepared to develop and produced some tentative research designs for further consideration.

7. Activity seven dealt with analysis of legal and political problems, and the strategy needed for implementing programs under the Vocational Act of 1963.

A model was developed seeking to demonstrate the systemic interrelationship of vocational education programs to the political economic and social forces at work in a state or community. Iowa, Montana, Louisiana and Wisconsin were selected for study, as states with sizeable rural or non-metropolitan populations where vocational education programs differ significantly both as to structure and as to type and degree of commitment to financing.

In-depth analysis of the statutes and administrative rules the four states was completed. Interviews were conducted with key educational administrators, legislators, and legislative research bureau directors who deal regularly with the private-group and public forces at work in shaping a vocational education system.

In conjunction with another project, a paper titled "The Effects of Governmental Structure and Administration Upon Public Education Systems" was prepared by Donald E. Boles.[1] It is expected that it will appear as a chapter in a book to be published in the near future.

From interviews and other research it seems apparent that there are sharply divided opinions among policymakers and school administrators concerning the educational theory of a man who is entrusted to direct and develop the main thrust of a state's vocational educational programs. The different schools of thought include, at least, each of the following:

1. The proponents of the "old trade school" concept.
2. The proponents of a strictly "academic school" approach to vocational and technical education.
3. The proponents of the strictly "technical" or quasi-engineering school.
4. The proponents of the "new school" concept which reconceptualizes these schools' role toward various programs traditionally offered at colleges and universities such as journalism, data processing and computer programing.

This debate is far from academic and draws powerful and sometimes strident dissent from diverse constituencies within the political and socio-economic spectrum of the community.

As has been pointed out, decision making in the field of education requires a sharp-eyed awareness of the systemic quality of the processes developing and controlling a governmental function.

In essence, one of the primary concerns of this study was to attempt to evaluate and analyze the system in which vocational education operates, thereby affecting and being affected by the overall political, economic, and social constraints of American society.

Of 18 non-metropolitan states, four were chosen as having sizeable rural populations. These were: Iowa, Wisconsin, Louisiana, and Montana. These four were selected because they differed in important respects, particularly the different types of existing vocational programs and the degree in which they obligated themselves, financially, to vocational education. In approaching the analysis of the states of Iowa, Wisconsin, Louisiana and Montana, the initial institutional focus was upon state law and the legislative process. This assumed that the legislatures are to some degree central and instrumental in shaping vocational educational policies of the state.

There are various ways of looking at a governmental function such as vocational education. One may observe the constitutions and laws governing and establishing such a system. Second, one may look at the way in which governmental function is, in fact, administered. This may or may not correspond to the intent and the spirit of the constitution and the laws. Three, one may look at the overall political, economic and social system in which particular functions operate to see why in fact, the governmental function is affected by and affects the overall system.

In an attempt to develop a systematic methodolotical overview for purposes of visualizing this essential interrelationship and to encourage further conceptualization regarding the fundamental relationship, Figure I was developed as a model and should be regarded as merely a starting point.

The statute law and administrative rules of the four states studied in depth ranged from the highly detailed and codified statute law of Wisconsin to the almost non-existent statutory provisos of Montana. Wisconsin and Louisiana have the oldest and most extensive vocational school systems of the states studied, but Louisiana law is less detailed in spelling out the structural side of the administrative system. This is perhaps traceable to the fact that financial support for the schools comes almost entirely from the state and is administered from the state level also. In the case of Wisconsin, fiscal independence was given to the local school boards and this, coupled with the high degree of local and administrative autonomy, accounts for the detailed statutory constraints. This is consistent with most patterns of local governmental law where Dillon's rule prevails. This, of course, is the judicial doctrine of long standing which stipulates that a local governmental agency may do only those things specifically authorized to it by state law.

From the standpoint of the effects of partisan politics upon the vocational school system, there seems no question in this investigator's mind that politics plays an infinitely greater role in the vocational and technical school systems of Montana and Louisiana than it does in the state of Iowa and Wisconsin. In the latter two states, the analyst was to encounter no instances of significant partisan intrusion into the policy making or administrative sides of these programs.

8. Activity eight deals with the use of sampling techniques for collection of occupational data by skill clusters. This work will continue beyond June 30, 1968, but to date the problem and certain results can be reported.

Technological progress and lack of co-ordinated plans for human resource development have resulted in critical discrepancies between supply and demand for workers with specific occupational skills. Examples of emergency legislation to cope with the problems of unemployed and unskilled labor are the Manpower development and Training Act of 1962, Vocational Education Act of 1963, and the Economic Opportunity Act of 1964. These and other forms of legislation have attempted to alleviate the problems of the unskilled and untrained manpower, as well as unemployment.

There is an imperative need in the State of Iowa for current occupational information which can be used in making decisions and planning for occupational curricula. The increased emphasis on the need for new and expanding vocational-technical education and the advent of area schools in Iowa have brought to the forefront a series of crucial unrelated factors for which educators must have answers as they go about a task of allocating resources and developing programs.

Many broad factors or variable such as inter-state and intra-state migration, military draft, new industry development, defense contracts and construction, federal legislation and state and federal aid to education have caused rapid changes in the demand for and scarcity of trained labor. Other related factors include occupational obsolence, upward mobility, and need for upgrading, for advancement, and the necessary "lag time" needed for training between recognition of need and placing trained workers in jobs.

Appropriate occupational information needed to justify educational program decisions is not adequately available. This is a critical problem--its solution should have high priority because of the implications to educational program planning. Available occupational data from census material are too general and collected too infrequently. Similarly data from the Iowa Employment security commission provides occupational information by industries not by skill classification.

This research was prompted by reviewing various survey results obtained by using mailed questionnaires. Because of the inadequacies in communications and nonresponse, many of these resulted in a series of shortcomings that did not provide sufficient and useable information. After considering several alternative courses of action, the decision was made to conduct a pilot occupational skill survey on a sampling basis, using personal interviews.

Examination of available occupational information revealed some critical shortages of trained workers in Iowa metal working industries. A series of meetings with the Employment Securities Commission, the Director of Research Coordinating Unit, and others lead to the decision to proceed with the survey. This study, partially supported by a federal grant from the U.S. Office of Education, has the support and cooperation of the Vocational Education Branch of the Department of Public Instruction, the Iowa Manufacturers Association, and the Iowa Development Commission.

The major problem was the development of procedures or techniques for the periodic collection and maintenance of up-to-date occupational data responsive to changing conditions.

The purpose of this project is twofold:

1. To collect current occupational information on job vacancies by using sampling techniques.
2. To develop skill cluster classifications for occupations designed to aid in curriculum development for the teaching of similar competencies.

The objectives of the project are as follows:

1. To define selected occupational skill clusters in the metal working area.
2. To determine the industries comprising the population from which the sample will be drawn.
3. To develop a technique for drawing a sample from the population defined.
4. To develop an instrument for collection of the occupational data.
5. To interview the sample of selected industries.
6. To tabulate and analyze the results and make job projections.
7. To disseminate the information generated to planners of curricula and programs for vocational and technical schools and to cooperating agencies and industries.

Results of the survey technique indicate wide acceptance of the sampling procedure and interviewing procedure by business and educational bodies as well as by representatives of manufacturing firms contacted in the survey.

Results of the survey show: (1) growth and retraction trends exist in certain occupations within sampled firms, (2) hard-to-fill jobs exist in certain occupations within sampled firms, (3) training programs are decried by workers and employers, and (4) training programs within plant or school or both are means to advancement in the skilled jobs.

D. Project Results

Aggregate project results from the Strategic Intelligence Unit and the Research Activities Unit under this contract indicated the multi-dimensional nature of the problem structure surrounding vocational and technical education and the need for creative and novel approaches in research and development, including inter-disciplinary research.

An inter-disciplinary attack upon problems of non-metropolitan areas is required for several important reasons shown from results of work cited.

First, people in the town-rural complex were found to be buffeted by a multitude of political, social and economic changes. These changes, largely created by forces beyond their control, affected these town and rural residents very significantly and subtly.

These affects were shown in changes relating to job opportunities, school tax burdens, and forced occupation and geographic migration. Decline in non-metropolitan area service business and in population age 18 to 40 sharpened the problem.

Results showed that with national economic growth and the resultant technological development calling for substitution of capital equipment for labor on the farm and in other basic industries, the farm labor force and the rural-town labor force has declined drastically in the last 25 years. Farming opportunities for rural youth dropped off tremendously giving rise to needs for non-agricultural vocational education.

National economic growth has resulted in large scale economic operations, but has forced great social and economic adjustments on non-metropolitan area citizens. Small towns and rural areas have now become over supplied with social institutions designed for less mobile, more agrarian, and more populous areas of the not too distant historical past.

Results have shown that questions are being raised about the need for consolidation of local governments, local churches, local businesses, local educational structures, and other local community services whether public, quasi-public, or private. This has been forced because of money and resource constraints. Consequently, non-metropolitan area social, political, and economic institutions are being forced to spread over greater and greater space and serve people at greater distances.

IV. DISCUSSION

Discussion of results will be divided by major project components.

A. Strategic Intelligence Unit

Early in the project work, Strategic Intelligence Unit members started taking a very broad view of research and development problems.

The current dissension, confusion, and disorganization existing in the collective mind of society regarding educational activity, demands the broad and general beginning.

Defining the functional aspect of education as change with choice gives a collective starting point from which to move and emphasizes interaction over time and within time among the individual's environment. This state of knowledge within the individual and states of knowledge in the collective minds at hand interact to give education or change with choice.

This general approach to problem setting for vocational and technical education concerned itself with present and past unrealized human, social, and economic goals, alternative ways to fulfillment, and how these were constrained within existing laws, programs, educational philosophies, and beliefs in the minds of leaders.

Research concerns could be built around constraints upon goals, goals themselves, and interaction between these two in the dynamic process of functional education. Also, research could be concerned with theories of past and present and hypotheses from these. Generating testable hypotheses regarding the process of education using existing research techniques could be a primary concern of educational research. Beyond this could be a concern, also, for the way in which results of these statistical tests altered or fail to alter educational practice.

The following research and development problem clusters were accepted by the Strategic Intelligence Unit: (1) human resources, (2) social institutions, and (3) societal organizations and goals.

This clustering resulted from examining problems which had social, political, economical, educational and technical characteristics.

Work of the Strategic Intelligence Unit resulted in suggestions for manageable research projects which would be concerned for definitions of parameters constraining vocational and technical education within the general social framework.

The Unit also established general areas in which research work for non-metropolitan areas might be directed. These were: (1) training opportunities in growth industries for those without proper skills so that these non-metropolitan area people could enter growth areas of the United States economy, and (2) training having highest payoffs to society.

Present problems include finding training systems with the highest payoff for those trained and for society, too. This payoff can be evaluated in terms of increased productivity, maintenance of income stability within the economy, escalation of income for the individual, social impacts of training on individuals and families mobility for higher income, social impacts upon a given community, or social results of a high degree of mobility.

Further research concerns could deal with social innovations for institutional change. Social institutions are lagging behind technological change. Questions about the present adequacy of educational systems for an industrialized society can be raised and are fundamental. What are the implications of a shorter work week for this educational system, particularly the vocational and technical aspects of the system? What is the social responsibility to improve the individual as a member of the social order? Does an occupational schooling need to have its status changed so that it is considered to be equal to a college preparatory program within a high school? Is there need for a larger degree of in-service training? Are needs present for schools which are intermittent and available for short periods of time for itinerant workers, their off-spring, and older adults beyond the usual high school age? Is it possible to use laymen or non-professionals as teachers? Does a governmental structure or a business organization have a responsibility to teach migrants? Have needs arisen for special schools for migrants and non-assimilated nationals? Is there a need for organizational structures within vocational and technical education to aid in horizontal mobility across jobs as well as vertical mobility within jobs?

Beyond the questions above, questions for research might be raised to deal with vocational-technical educational structure and its characteristic decision-making framework.

Unit members discussed material received by the Research Coordinating Unit directed by Dr. Trevor Howe. Publications prepared, and in the process of being prepared, on work areas covered by vocational and technical education were examined.

In developing research needs in vocational and technical education, the Unit believed one might distinguish within the human resources category the needs of youth specifically, and then the needs of society specifically. How youth is prepared for societal life and work in today's industrial society and today's labor markets is highly significant if society is to sustain the ability to increase productivity and fight inflation as well as unemployment. To sustain adaptability of the changing economy within this society is of great importance.

Societal needs and individual needs may differ. Therefore, separate examination and joint examination is needed. The process of formulating and acquiring a suitable training system for youth needs examining. Goals and objectives arising from policy-makers, concepts and from philosophies may not be specifically adapted to the reality of today's industrialized economy.

The training needs of youth as suggested by W. G. Stucky include: (1) training which is career-oriented and gains youth initial access to the job market and equips him for initial responsibilities in society; (2) programs designed specifically to enable youth to earn while learning or learn while earning; (3) inservice-training to assist youth who have become part of the new labor force and to assist older workers who desire more complex skills, or more responsibility in their "Nth career" preparation; (4) information which enlarges youth's perception of the economy, the societal order of the nation, the future job market, and the alternative income-increasing choices available to him; (5) ungraded intermittent training schools for youth who are migrant workers and children of migrant workers, and (6) special schools for immigrants (youth and adults) and for citizens who have had only intermittent success in school.

The training needs of society as outlined by W. G. Stucky include: (1) information on which an adequate understanding can be built of the broad range of educational needs of a highly industrialized society which makes massive public and private investments in science in order to produce new technology; (2) an educational philosophy which fosters development of a system of (in-service) training by "Nth career schools" operating as a perquisite to working by those employed in sub-professional occupations especially; (3) information to improve understanding of the changing job structure, rates of employment and windfall in income gains and losses from changes in technology; and (4) information which would enlarge understanding of the need for mechanisms to continously appraise the nature of problems concerning the formation of human capital and which would aid in formulation of alternative innovations in institutions.

Pertinent to developing more research areas would be an overview or survey of the history and philosophy of education in the nation, particularly the role of vocational and technical education in a democratic society. Administrative policies for vocational and technical education would also be an aspect of this study. Pointing up agreements, disagreements, and alternatives which have been developed for vocational and technical education would be significant.

Developmental research could take the following pattern. A number of individuals could each write a report, not a detailed research activity. This report could include feelings and conclusions regarding vocational and technical education. These could give a focus on problems, not techniques. The Unit could use these to discuss kinds of educational systems needed.

It appears possible, from Strategic Intelligence Unit work, to imagine a framework in which educators are in communication and constant touch with activators in vocations and technical services even under conditions of dynamic economic change as it now exists. Continuing education of teachers and of citizens could be a logical outcome of this particular pattern.

Quite probably vocational and technical education can be devised for what has been considered low levels of abilities. Questions of below average capability and retardation need more exploration. Some myths have been exploded.

Needs are numerous. Concern for all regardless of their IQ scores needs to be more in evidence. Training for good citizenship is important. There are at least these steps in retraining: (1) high school level skills, (2) incentives to rise in the vocation, and (3) generalized training for social living and adaptation to a changing world.

A core of knowledge may be found essential to many jobs. In examining these questions, labor force attitudes could be examined for conflicting pressures, and for special interests.

Many youngsters in agriculture are going to migrate to get jobs. These people haven't been around industry so they have not formed models. This means they don't have a realistic conception of the occupational world.

Research work indicates critical stages at which job decisions are made. It also indicates young people engage in fantasy.

Junior high school is a critical point for job decisions because individuals must decide on which curriculum to follow: college, general, or non-college.

Problems and questions arise about differences between basic and applied research, and how money and time should be allocated between each. The quality and quantity of research in vocational-technical education depends on this allocational choice. In general, both types of research seem to be needed: (1) basic research for new theories and insights and (2) exploratory studies to determine what the on going situation actually is surrounding vocational and technical education.

The term "vocational" is an extremely broad word and people use it in various ways. It has become extremely vague in its uses today and has caused some disagreements which are rather unnecessary.

Young people 18, 19 and 20 years of age are economic creatures for the most part, They are motivated to a greater degree if they can see where they are going and how they benefit directly from their education. The best motivation to a student is a clear objective.

Automation is creating more and better jobs all the time, but these take people who can understand the methods. It's up to educational institutions to do the preparing properly. When courses are tied to immediate values and these values are possibly phased out in the near future, an argument arises for putting more emphasis on theory and basic understanding.

Serious research is needed to help high school counseling. By using statistical methods in research,one can tell much more about popular wants, needs, interests, and abilities. At the present time, test results allow us to be certain of very little about any one specific individual. This is because there are far too many variables to handle readily. Ignorance exists regarding interaction between these many variables.

A number of qualities need examining. These include: (1) mental dexterity, (2) interests and aptitudes, (3) available energy, (4) physical dexterity, (5) perceptual acuity, and (6) emotional stability.

Possibly too much faith is placed in current test results. These results may explore too narrow a concept of human character and quality. Current tests may examine mental efficiency without looking into the means by which the human system communicates and how it manages the tools that it has to express ideas and to perform creative activities.

Judicious use is needed of the present theories, analytic tools, and scientific methods of testing hypotheses regarding human resources. Training capabilities and needs, organizational structure, present systems of development, and how the human resources react to these aspects of vocational and technical training can be objectively examined.

Inter-disciplinary creativity can be used for new conceptualizations of old problems and for novel approaches to these.

A sub-committee of the Strategic Intelligence Unit was formed to plan and develop a conference for November, 1967. This became a Conference On The Policy Issues and Developmental Problems of Providing Post-High School Vocational-Technical Education.

This conference was sponsored by the Research and Development Unit on Vocational-Technical Education and The Center for Agricultural and Economic Development, Iowa State University. The conference was developed as a means to appraise and improve the performance and efficiency of providing adequate vocational-technical education. Perhaps three-fourths of the nation's youth now complete their formal education between mid-high school and mid-college. Many states throughout the nation are accelerating the development of a wider range of ecucational choices to enhance the vocational-technical education of these youth.

In this developmental process, many new features and training systems are being added to, or made complimentary to, the traditional high school and college system. Thus, it is natural for questions to be raised as to purpose and of relationships with the traditional system, and for problems also to arise concerning the integration of the public financial support for the vocational technical educational system with the traditional system.

It is assumed the goal of society is to improve the preparation of youth for entering the economy and to increase their productivity as new workers. It is also assumed that society wants these youth to understand the traditions and social values of their civilization and further to be more proficient as citizens in managing their self-government. Education, therefore, must relate to the psychological, economic, social and occupational needs of the people involved. The training content of school must change over time to keep pace with the changes in the needs of prospective workers as the structure of the economy changes, as changes occur in the population structure and as changes in technology yield a differential distribution of incomes to the various sectors of the economy.

Conference Participants included representatives of the groups listed below. A major purpose of the conference was to create the opportunity for an open dialogue among groups within the Region VI States (North Dakota, South Dakota, Nebraska, Kansas, Missouri, Iowa and Minnesota).

Groups represented at the conference:

1. State departments of public instruction.
2. School system administrators.
3. University and college boards of regents.
4. Social scientists.
5. Staffs and advisory committees of Governors.
6. Industrial, trade and business associations.
7. Committees on education of state legislature.
8. Educational committees of organizations.
9. Professional educators in research, teacher training.
10. Interested lay people.
11. Labor departments.
12. Study commissions.
13. Employment security commissions and other agencies.

The conference participants were involved in the examination and discussion of issues relating to the following problems:

1. Specifying the vocational and technical education needs of people in the U.S. and Region VI and the states.

2. Determining how educational planning, training systems development, curriculum design, educational operations and outreach, building needs, etc., is done; from whence comes the factual information for such planning and development and by whom it is done.

3. How adminstrative and instructional programs are coordinated and integrated among the pre-high school, high school and post-high school components of the general educational system.

4. The public policy issues involved in establishing the financial support base, the method of financing, locating training centers, contracts with private industry, and the determination of the scale of operations.

5. The assessment of how well the new vocational-technical training system fits the training needs of the region.

6. The assessment of the operational capacity to meet the educational missions which are common to area schools and the programs established by other levels of government such as OEO manpower training programs.

Conference planning was handled by the sub-committee. The Strategic Intelligence Unit members listed:

1. Trevor Howe (Project Director).
2. Clarence Bundy.
3. Marguerite Scruggs.
4. Robert Thomas (Strategic Intelligence Unit Chairman).
5. W. G. Stucky (Secretary to the Unit and Chairman of Conference Sub-committee).

The program committee to be invited consisted of special invitations to the following state directors of vocational education:

1. Windol L. Wyatt, Iowa.
2. John E. Snyder, Kansas.
3. Sverre K. Wick, Minnesota.
4. Beauford W. Robinson, Missouri.
5. Cecil E. Stanley, Nebraska.
6. LeRoy Swenson, North Dakota.
7. E. B. Oleson, South Dakota.

B. Research Activities Unit

The research activities undertaken within this contract dealt with several aspects of problems of vocational and technical education and were divided as follows: (1) decision-making processes regarding capital investments, (2) drop-out problems of high school youth, (3) interrelationships between home and work, (4) labor requirements within agriculture and agri-related industries, (5) relationships between technological change and labor markets, (6) psychological research capabilities to deal with vocational and technical education, (7) determinants of post-high school educational and occupational choices, and (8) examination of vocational and technical training structures, law, and implementation.

Many aspects of socio-economic forces affecting vocational and technical training as constrained by statute and by subtle political forces were examined. The research possessed functional and institutional aspects.

C. Project Discussion

Compared to the others, non-metropolitan areas are at a great disadvantage in availability of opportunities for general education, vocational education, local employment, on-the-job training, and similar amenities. Facilities for vocational training the female labor force are entirely inadequate. Thus, in general, women must migrate to find jobs. They face a limited selection of vocational education opportunities relative to the occupations which exist, and relative to current and prospective demand for their services.

In addition, rural communities generally lack the breadth and quality of education available in urban areas. The range of offerings in adult education programs and short courses is narrow; the opportunities for employment in various plants and establishments which lead to an upgrading and accumulation of skills are extremely limited.

The thinning of the population and the relative decline in buildings and taxable property generally are reducing the tax base for supporting local education including vocational education. In addition, the selective migration taking place causes the "left behing population to be older and to have a lessened interest in those educational investments which pay off over the long run and in other geographic locations.

According to the 1960 United States Census, only about 25 per cent of the working force in Iowa were employed in farming whereas, about 12 per cent were employed in clerical and sales positions, 16 per cent in crafts and industrial positions and 16 per cent as operatives. While many Iowa youth entering the latter occupations may need competencies in agriculture or home economics, a large majority do not presently have opportunity for vocational education that meets their needs.

According to unpublished data gathered by the State of Iowa Department of Public Instruction, nearly 16,000 Iowa girls were enrolled in homemaking and 10,500 boys in agriculture in 1965. By contrast, only 1,490 pupils were enrolled in distributive and office education programs, and only 1,675 high school pupils were enrolled in schools with enrollments of 300 or more pupils. High schools with enrollments of less than 300 pupils offer little vocational education other than agriculture and home-making, and these offerings do not meet the needs of most youths who will migrate to jobs in metropolitan areas.

These data further indicated that of the 33,044 Iowa high school seniors were were graduated in the spring of 1964, 33 per cent were enrolled in four-year colleges the following fall, 10 percent in junior colleges, 10 per cent in business, trade and technical schools, and 3.5 per cent in apprentice training programs. The other 43 per cent of the 1964 graduates were not continuing their instruction following high school. Undoubtedly, many of the graduates who started in college will not continue and graduate. The apparent need for a strengthened program of vocational education at the high school and post-high school level is evidenced. Similar data may be presented for other states.

V. CONCLUSIONS AND IMPLICATIONS

Conclusions and implications relevant to this portion of the final report will be given for each major component of the project.

A. Strategic Intelligence Unit Conclusions and Implications

In examining discussions held by the Unit on the problems of vocational and technical education, the role of such training in the total educational systems was found to be confused and unclear.

This confusion implied a need for a working, functioning rationale for vocational and technical education. This working rationale could be drawn from a philosophy for education in a democratic society. This statement could be based on why the U.S. educates, on the present adequacy of existing education, on how the education is structured and changed, how its worth is to be measured, and how it adapts programs to new developments. Within this framework, a working rationale for research and development could arise. This would identify divergencies of thought out of which could come conferences on new ideas. Then theories specifically dealing with vocational education and its legal setting for a state and nation might be developed. Discussion and analysis could follow of administrative definitions of laws and their implementation within the legal, socio-economic, and political framework affecting workers and training for the world of work.

Purpose, function, clientele, organizational structure, administrative authority, and teacher training are all to fit within the general rationale.

Training problems are still confronting the unemployable, particularly those in depressed areas like the agricultural deep south, the upper peninsula of Michigan, and Appalachia, where lack of training, wrong location, wrong work habits, and poor attitudes are primary problems. Programs run into trouble with managerial personnel who cannot supply the needed vision. Programs for urban areas are only part of the solution to problems of unemployment, unfilled available jobs, and inflation of wage rates. Nation-wide human renewal must be the goal with use of imagination, brains, money, and organizing talent. Programs for human resource development can be emphasized to get a person off government welfare roles and into government taxpaying columns as a return on any investment in human resources at any governmental level.

Studies of United States economic problems today are spreading and broadening their dimensions. Attributes of socio-psychological problems of the unemployed are being included. Trained research personnel can help human resource development programs in five specific ways: (1) provide technical assistance to action agencies concerned with human resources development; (2) institute programs of information on research developments and evaluations of existing programs; (3) provide training orientation programs; (4) provide human resources training in curricula for students who expect to be working in human resource development fields; and (5) provide research programs dealing with resource development policy.

B. Research Activities Unit. Conclusions and Implications.

In research dealing specifically with decision-making on vocational-technical education bond issues, an analysis of data collected in the study indicated no discernable pattern to be followed to assure success in passing a school bond election. The purpose for which the election was held did not appear to be associated with the outcome of the election. There was a lack of consistency or pattern in the techniques employed in the campaign strategies promoting these school bond elections. As a result, many of the correlations obtained in this study were not related to the percentage affirmative vote, hence not to the outcome. In addition, many correlations were not in the expected direction. In view of the review of the literature for this project, it was not anticipated that most communications variables (as measured in this study) would be negatively related to election success or conversely that the traditional techniques of election communication strategy would correlate highly with the unsuccessful districts.

An inter-connection exists between job training programs and a balanced economy. This inter-connection must be recognized to forestall the likelihood of another serious imbalance. The balanced growth of an economy gives economic security and national well-being by providing customers who have a steady demand for goods and services, and by providing people with a psychological sense of achievement.

Trained research personnel can further aid vocational and technical education by examination of processes for decision-making on educational policy. Further, deciding what part of the educational system ought to be left to industry is another concern.

Psychologists can help in concern for problems surrounding skill development. Some psycho-motor skills are basic to many occupations. Not much research on common characteristics has been done. These common features include attitudes, habits, degrees of maturity and value system.

Clusters of possessed skills as well as psychological, sociological and economic factors influence people's opportunity and willingness to pursue education necessary for personal and economic development. The United States' economic and educational systems have not developed a capacity to utilize innovation.

When a general lack of association between the outcome of the election and the variables used in this study was found, the hypothesis that "closely contested" issues would differ from the remaining elections was advanced. Closely contested issues were defined as those receiving from 50.0 per cent to 69.9 per cent favorable vote. Districts that received large majorities and those that received less than one-half of the vote were defined as outside the closely contested issues. This resulted in 89 of the 195 districts being classified as "closely contested". The rationale was that if the outcome was predicted to be very much in doubt, different strategies might be used to attempt to secure a favorable vote on the bond issue.

In studying certain Iowa public school dropouts, it was seen that most of the dropouts came from large families and frequently brothers and sisters who also had dropped out. Many had parents who had not finished high school. Approximately 30% of dropouts' fathers were farmers, occupations for the rest being nearly evenly distributed among the major census classifications of managers, craftsmen, operative, and laborers.

Several additional factors contributing to dropping out were examined. They included lack of extra-curricular interests, owning a car, missing school for employment or work at home, low academic standing, influence of parents and friends, reported lack of interest and individual help given by teachers, dislike of teachers or school officials, unpleasant experiences with teachers or other students, an unhappy home life, and a record of previous dismissals or withdrawals from school.

The most common reason for dropping out was loss of interest or dislike of school and courses for the males and marriage or pregnancy for the females.

Thirty-eight of the male dropouts and twenty-three of the females reacted favorably about having an advisor from outside the school system. A number commented such a program migh have kept them in school.

Some of the dropouts' suggestions for school improvement included curriculum expansion to include various types of vocational-technical education, special teachers, and classes for slow learners, more individual help, and better counseling.

Results indicated that only in a few cases was the decision to leave school a spontaneous one for the dropout. For this reason, dropping out has been sometimes referred to as the "dropping out process". Because of the necessity to identify the potential dropout before withdrawal, increasing attention has been placed upon identifying chracteristics common to most dropouts. Most dropouts came from families of low socio-economic class. The dropouts themselves often showed a marked disinterest in school and related activities.

Based on these findings, the following recommendations might be made: (1) expanded curriculum offering to include additional vocational or technical courses; (2) to utilize information on characteristics of potential dropouts for early identification and corrective action; (3) special assistance to pupils having difficulty especially in core curriculum courses; (4) to provide expanded guidance services; (5) utilizing high school cooperative programs when vocational courses cannot be offered; (6) to provide an opportunity for the development of interest and motivation;

(7) to make adult or correspondence courses leading to a high school certificate available especially to girls who had dropped out of school because of marriage; and (8) follow-up and assistance to dropouts in securing employment or additional training.

A number of characteristics of the home environment of skilled, semi-skilled and unskilled workers appear related to the employment record of the husband. Based on the intercorrelations among variables, clusters of characteristics of home environment and employment were tentatively identified. Further studies should include the formation of clusters of related variables after data are obtained from a sample larger than the one on the present study.

Characteristics of the home environment that appeared positively related to the interrelated employment variables, criterion group or wage group at time of the study, mobility, wages, and seniority, were psychological characteristics of the wife, number of suggestions for house improvement, type of clothing worn by the man to work, preference of the wife for a fourteen dollar dress over two seven dollar dresses and knowledge of food and nutrition on the part of the wife. Knowledge of textiles and clothing by the wife was positively related to seniority; attitude of the wife toward the job of the husband, to wage group; extent to which the husband selected his own clothing, to wage group and seniority; and management of resources, to wages.

It is recommended that the relationships identified in this study be investigated further in a survey of employees in industrial, distributive and service jobs for which vocational and technical education provide training. A number of the measures of the variables need refining to provide for increased reliability.

In a preliminary analysis, used as a guide and model to be followed in determining the amount and quantity of labor and hence, training required in those regions shifting their agriculture to a less intensive basis, it was found that vocational training units to provide the range and depth of skills required, would entail fewer vocational training departments devoted solely to farming. However, these shifts in farming and training structure also would require, in each of these units or departments, more than one specialist so that the expected and necessary subject matter can be covered. In addition, a smaller number of high schools covering a wider territory could be used for an advanced third year directed towards the managerial-oriented segment of the farm labor force.

C. Project Conclusions and Implications

This project for research and development in vocational and technical education for non-metropolitan areas in the United States dealt with the problem framework by means of group examination and individual research.

In considering inter-temporal problems for human resource development, overall models need to recongnize development of social institutions, possible goals and objectives, variety in societal forms, and ranges in social orders which could give objectives ranging from absolutism to nihilism.

However, for the project's problems one may presume people seek to approach democracy with its implications of equality for all individuals. This appears at least as the stated objective of the present United States social order. The degree of willingness to pursue this objective or ideal varies tremendously across areas and socio-economic groups. Further, even if there is behavioral agreement upon the social objective, the time path to follow and the interval of time to allow before fulfillment of the goal varies tremendously.

Problem examination can lead to research and development to provide information for adequate perception of the present situation and of prospective changes over time in the general social order.

Different influences upon the institutional structure could be recognized in the problem situation and the impact upon vocational and technical education could be discussed.

VI. SUMMARY

In this summary a brief description of problems and focus of this project will be discussed. The main project components were the Strategic Intelligence Unit and the Research Activities Unit, so the summary deals with these major divisions.

A. Strategic Intelligence Unit

In summary, the Strategic Intelligence Unit was designed to explore the broad dimensions of problems of vocational and technical education in non-metropolitan areas. In pursuit of this objective the Unit saw certain research areas which might be immediately explored and recommended certain activities be started.

The report of the Strategic Intelligence Unit shows that the Unit began its work by seeking to determine whether or not interdisciplinary discussions could be developed and carried forward. The Unit succeeded in developing a sound basis for inter-disciplinary examination of problems associated with vocational and technical education.

Recommendations were developed for educational research, for educational programs, and for possible integration of these.

First, educational programs might be integrated from the cradle to the grave with opportunity for work entry and re-entry at key points along the span of human life if the ideal of democratic education is to be pursued effectively. Second, vocational and technical education might be made an integral part of this total process. Third, policy makers and decision makers for the educational system and its structure need to be so selected that they are complementing the objectives and goals which society has for the institutional structure which performs the function of education for the individuals in this democratic society.

From these recommendations one recognizes major components of problems of conceptualizing education both as a democratic institution and as a democratic function. Logically, one needs an explicit policy which has multiple goals because of the variety of variables.

The Unit explored ways to integrate relevant findings with institutionalized vocational and technical education for innovation and program development and decided that working through Research Coordinating Units, State Departments of Public Instruction, and governmental and private agencies for action and for dissemination of information would be the future course to follow as specific findings were available.

The Strategic Intelligence Unit developed a background of conceptualization of problems of education with emphasis on the problem domain of vocational and technical education. With much effort and energy the Unit worked in an inter-disciplinary fashion across disciplines and as a group, not as a collection of individuals each charged with a specifically delimited disciplinary area. Objectives of vocational and technical educational activity, problems of achieving objectives, and alternatives to achieving objectives were developed in varying detail by the Unit and its committees. Unit membership encouraged the beginning of certain research.

With its conceptualization of the total problem area surrounding vocational and technical education, and its focus on vocational and technical education, together with emphasis placed on certain research areas to be explored, the Strategic Intelligence Unit fulfilled the task set before it by this project.

B. Research Activities Unit

The Research Activities Unit contained several inter-disciplinary studies of problems of vocational and technical education in non-metropolitan areas.

The objectives of the study were to: (1) analyze the decision making process of the school districts regarding vocational education training programs; (2) to determine crucial variables related to the "success-failure" continuum of proposed vocational education and training programs of school districts, and (3) to make recommendations on the strategies for social action to secure positive decisions by school districts on recommended vocational education and training programs.

Also examined were occupational problems and vocational training needs of high school dropouts from rural areas in Iowa. This project: (1) identified several factors and combinations of factors responsible for drop-outs; (2) identified some job skill deficiencies in training needs for dropouts, and (3) used this and other information to suggest a basis for curriculum adjustment, improved guidance, and other changes.

Interrelationships of home environment and employment were studied. The objectives here were to identify characteristics of home environment related to successful employment of skilled or semi-skilled workers. The procedure used was to interview selected employers. The sample was limited to male workers. Individuals were selected who were married, who had one to four children and who were residents of non-metropolitan areas.

Manpower requirements and demand in agriculture by regions and nationally, with estimation of vocational training and educational needs and productivity was taken up by a group of research personnel

In estimating the work force and skill requirements in agriculture, the study must also estimate the future migration of labor and of population from agriculture and the manner in which vocational and technical education of the rural community can be adapted so that this education serves both those who stay on the farms and those who leave. Though technical and vocational needs have changed rapidly in the past, the next 15 years will see more rapid change. The skill and knowledge needs of agriculture will change greatly because the humber of farms will shrink almost by one-half in the next decade. Because of this, the farming industry will become more highly specialized. Managers

Examination of ways to predict change in technology, jobs and vocational training needs in non-metropolitan labor markets was undertaken. Objectives of this study were to design a model to predict changes in job opportunities and vocational training needs in rural labor markets which would fit the framework of a functional economic area. Short run demands for labor, the shifts in demand, and vocational training needs were the principal concerns. This study used a questionnaire to get at the demands and training requirements.

An examination of potential contributions of psychology to inter-disciplinary research in vocational and technical education was started. The objectives of this study were (1) to determine the role of psychologists in inter-disciplinary research in vocational and technical education; (2) to formulate a basic conception of the role of the psychologist in an interdisciplinary research program in vocational and technical education for non-metropolitan areas, and (3) to work with staff members in the development of specific research proposals to coordinate efforts for maximum efficiency.

Exploration began on determinants of the post-high school educational and occupational choices of Iowa farm boys. This study was designed (1) to add knowledge of the process and of the determinants of post-high school educational and occupational choices of farm boys; (2) to find the obstacles which prevent further investment in training and education; (3) to analyze variables determining these plans, and (4) to relate these plans to past experiences.

Research which analyzed legal and political problems and the strategy necessary for implementing programs under the Vocational Education Act of 1963 was also started. This project sought answers to questions regarding how any government allocates its limited resources with respect to education and questions of why resources are allocated as they are. The initial institutional focus would be upon the state law and legislative process. To be examined were present laws and administration of vocational-technical educational programs, their leadership, and their organization.

C. Project Summary

The Strategic Intelligence Unit and the Research Activities Unit were the two main components funded under this project for research and development in problems of vocational and technical education for non-metropolitan areas. Problem conceptualizations and inter-disciplinary research were the activities of these project components.

The primary function of the Strategic Intelligence Unit was to provide information regarding vocational and technical education for adequate perception of the present situation and of prospective changes for the future. For this are needed estimates of the present and future environment and problem situations into which vocational and technical education in the United States is now cast and into which it will move. This perception of the present and future is believed to be required in order to alleviate crises in the near future.

The Strategic Intelligence Unit of this project was concerned with perception, assessment, and articulation of the existing social milieu as it impinges upon vocational and technical education.

The Research Activities Unit was designed to carry out significant research on problems related to vocational and technical education for non-metropolitan areas. This research activity was conducted primarily in three research areas: (1) human resource development, (2) occupational opportunities assessment, and (3) educational resources development and training.

The Strategic Intelligence Unit, which conceptualized components of problem areas surrounding vocational-technical education, and the Research Activities Unit, which conducted research activities, formed the organizational structure and working mechanism of this project for research and development in vocational and technical education for non-metropolitan areas.

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Robert W. Thomas

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ABSTRACT

This final project report is a composite of work done in two units; (1) the Strategic Intelligence Unit, and (2) the Research Activities Unit, both funded under contract O.E. 5-85-108 between the U.S. Office of Education and Iowa State University, Ames, Iowa.

The Strategic Intelligence Unit was charged with two tasks: (1) to think creatively about problems associated with research and development in vocational and technical education, particularly those problems found within non-metropolitan areas, and (2) to conceptualize problems surrounding vocational and technical education so that logical models of the total problem structure might be created.

The Research Activities Unit conducted research studies dealing with research and development problems associated with vocational and technical education for non-metropolitan areas. These activities dealt with: (1) problems-school district decision-making, process affecting vocational and technical education programs, (2) occupational problems and vocational training needs of Iowa high school youth, (3) interrelationships between home environment and employment, (4) manpower requirements in agriculture and in agri-business with training needs for these requirements, (5) problems of predicting change in technology, (6) contributions of psychology to inter-disciplinary research in problems of vocational and technical education, (7) determinants of post-high school educational and occupational choices of Iowa farm boys, (8) an analysis of legal and political problems and strategy necessary for implementing programs under the Vocational Education Act of 1963, and (9) collection through a sampling technique of occupational data by skill clusters.